REMARKS

This Amendment is filed in response to the Office Action dated June 29, 2004, which has a shortened statutory period set to expire September 29, 2004.

The Cited References, Either Individually Or In Combination, Fail To Disclose Or Suggest Applicant's Invention

Claim 1, as amended, recites:

> performing a full image backup in disk order on a plurality of data blocks stored by the at least one primary data source;
>
> initiating an incremental backup at a predetermined interval, the incremental backup including file system metadata; and
>
> comparing a modification time of each file/folder at the predetermined interval to a defined time, wherein if the modification time is earlier than the defined time, then excluding data blocks of that file/folder from the incremental backup.

In contrast, Shannon teaches a computer file backup method rather than performing a full image backup. Although Shannon states that a "full image" can be created on tape or floppy disk (col. 1, lines 32-35), the actual backup method described by Shannon relates only to the saving and updating of files. Therefore, Shannon performs a file-by-file backup. In contrast, Applicant performs an image backup in disk order on a plurality of data blocks. As noted by Applicant, because disk order (not file order) is used, an image backup can be significantly faster than a file-by-file backup. Paragraph [0004].

To ensure an accurate incremental file update, Shannon further teaches creating a logical disk map of the client computer disk. Col. 3, lines 6-7. This logical disk map is copied to a disk of a server computer. Col. 3, lines 8-11. The

logical disk map is periodically updated to create a list of modified/removed files. Col. 3, lines 17-23.

Using a map to facilitate the incremental backup adds significant system overhead. Specifically, as described as prior art by Applicant in paragraph [0005],

> In systems that want to provide image incremental backups, the additional software to track changes must be enabled. This software, at a minimum, must track which portion of the file system or storage has been re-written. This usually involves updating a map or a list tracking which blocks have been re-written. Thus, all write operations now require at least two writes: one write to update the change list or map and another write to write the data. Therefore, this method adds 100% overhead for writes on systems wanting to enable image incremental backups.

Note that a map update involves a map-to-map comparison, thereby adding considerable complexity and time to the update process. Applicant's technique advantageously eliminates the additional complexity and overhead of updating a map, like the logical disk map taught by Shannon.

Specifically, and recited in Claim 1, the modification time of each file/folder can be compared at the predetermined interval to a defined time. If the modification time is earlier than the defined time, then the data blocks of that file/folder can be excluded from the incremental backup.

As taught by Applicant in paragraph [0023], including file system metadata in the backup significantly increases the accuracy of the backup compared to a standard file-by-file backup, which only identifies new/changed files. Moreover, because each file's/folder's modification time is already part of the file system metadata being tracked and updated by the

file system, this backup method has no associated overhead during normal operation.

In contrast, Shannon apparently distrusts this file system metadata. For example, Shannon teaches that the date on a vast majority of MS-DOS machines is an unreliable indicator because the date is poorly maintained. Col. 1, lines 63-65. Therefore, Shannon teaches away from Applicant's recited use of the modification time. In lieu of Applicant's simple but effective method, Shannon creates the elaborate and time-consuming logical disk map, as described above.

Midgely fails to remedy the deficiencies of Shannon. Specifically, Midgely also teaches a file-based backup. Col. 1, lines 59-61; col. 2, lines 34-36; and col. 2, lines 63-65. Therefore, Midegly teaches nothing regarding a full image backup in disk order. Midegly also teaches nothing regarding the use of file system metadata during an incremental backup. Midegly further teaches nothing regarding excluding data blocks of a file/folder from the incremental backup.

Boecker fails to remedy the deficiencies of Shannon and Midgely. Boecker merely teaches a method for dynamically changing computer system time-of-day clocks to coincide with seasonal time-of-day changes. Col. 1, lines 17-21. Therefore, Boecker teaches nothing regarding a full image backup in disk order. Boecker also teaches nothing regarding the use of file system metadata during an incremental backup. Boecker further teaches nothing regarding excluding data blocks of a file/folder from the incremental backup.

Oracle fails to remedy the deficiencies of Shannon, Midgely, and Boecker. Oracle teaches backing up files in the database. Page 18-8. Therefore, Oracle teaches nothing regarding a full image backup in disk order. Oracle also teaches nothing regarding the use of file system metadata during

an incremental backup. Oracle further teaches nothing regarding excluding data blocks of a file/folder from the incremental backup.

Because the cited references fail to disclose or suggest Applicant's backup method of Claim 1, Applicant requests reconsideration and withdrawal of the rejection of Claim 1.

Claims 2-12 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 2-12.

Claim 13, as amended, recites:

> performing a full image backup in disk order on a plurality of data blocks stored by the at least one primary data source;
>
> initiating an incremental backup at a predetermined interval, the incremental backup including file system metadata; and
>
> comparing a modification time of each file/folder at the predetermined interval to a defined time, wherein if the modification time is later than the defined time, then including data blocks of that file/folder in the incremental backup.

Therefore, Claim 13 is patentable for substantially the same reasons presented for Claim 1. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 13.

Claims 14-24 depend from Claim 13 and therefore are patentable for at least the reasons presented for Claim 13. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 14-24.

CONCLUSION

Claims 1-24 are pending in the present application. Applicant respectfully requests allowance of these claims.

If there are any questions, please telephone the undersigned at 408-451-5907 to expedite prosecution of this case.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as FIRST CLASS MAIL in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on September 28, 2004.

9/28/2004 Rebecca A. Baumann
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